ERIC Document Resume	See Instruction Sheet	DATE OF RESUME 7/12/65	DATE RECEIVED

A. PUBLICATION DATA

1. ERIC NUMBER	2. ORIGINATOR CONTROL NO(S).	3. IDENTIFICATION NO.
ED000289	7021	N.A.

4. AUTHOR(S):
Heist, Paul and Webster, Harold

5. TITLE OF DOCUMENT ABSTRACTED:
Differential Characteristics of Student Bodies - Implications for Selection and Study of Undergraduates

6. PUBLICATION TITLE:
N.A.

7. EDITOR(S):
N.A.

8. PLACE OF ORIGIN
ORG. Univ. of Cal.
ST. Berkeley, Cal.
CITY, STATE
TELE. EXT.
INST/LOC CODE

9. PUBLISHER OR SOURCE
University of California

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.A.	N.A.	59	

DO NOT WRITE IN SPACE BELOW

MICROFILM COPY AVAILABLE
YES ☒ NO ☐

COPYRIGHT GRANTED
YES ☐ NO ☒

COPYRIGHT RELEASE FILED
YES ☐ NO ☐

TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL ☒
FOLLOW-UP ☐

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR
experimental study

16. INDEXING TERMS (6-12)

experimental studies G-23	personality P-08	admissions R-07	
students Y-15	measurement Q-12	achievement R-04	
characteristics R-43	undergraduate edu. Y-33	honors programs S-10	
		remedial programs P-35	

17. ABSTRACT (MAX. 250 WORDS)

Includes tabular presentation of personality scores illustrating variation of student characteristics within and between institutions. Indicates need for differential treatment of students in areas of admission, student success, honors, and remedial programs.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION	20. DIVISION OR DEPT.	21. CONTRACT NO. / PROJECT NO.
	22. TOTAL COST OF PROJECT	
	23. DURATION OR PROJECT	U.S. Department of Health, Education, and Welfare Office of Education

ERIC Form 1

IV-2

7021 Q

DIFFERENTIAL CHARACTERISTICS OF STUDENT BODIES -- IMPLICATIONS FOR SELECTION AND STUDY OF UNDERGRADUATES*

Paul Heist Harold Webster

This topic, along with the others being presented at this conference, is necessarily very broad and complicated because it concerns both the vast domain of human individual differences, and at the same time the aims, both implicit and professed, of college education. From one idealistic viewpoint, all the characteristics of persons might be related to, or become integrated with, their educational growth and development. For practical reasons we must restrict the discussion to certain characteristics which at our present state of knowledge seem to be most pertinent to the ideals and practices of undergraduate American colleges.

There are two obscurities which perhaps should be mentioned at this point, since they tend to interfere with communication. One is simply that in actual usage mental measurements are in some cases predictors, or independent variables, while in other applications they are criterion variables, or what sometimes are described as "outcomes." Occasionally, the same test (or parallel forms) will in effect serve both purposes, because it is intended to measure changes over time. A second difficulty is that our topic necessarily includes mental tests of "motivation," a term which is much too vague. Possibly the term should be avoided entirely. For example, in the current theoretical meaning of the word, measures of the degree to which students enjoy studying, or of how efficient they are at it, and measures of general interest in scientific and esthetic ideas are both referred to

---

Paper read at the Conference on Selection and Educational Differentiation, May 25-27, 1959, Berkeley, California, sponsored by the Field Service Center and the Center for the Study of Higher Education, University of California, Berkeley.

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

ED000289

as tests of motivation. Occasionally we attempt to distinguish these by saying that the tests more explicitly related to studying are "more specific" motivation measures. But at this stage testing terminology is still sometimes not very clear.

The aims of higher education, either implicit or explicit, will largely determine who should be admitted to colleges, and we are immediately reminded that "success in college" is still a rather obscure phrase, despite some heroic efforts to clarify it. We feel uneasy when it is necessary to equate success in college with grade-point-average. However, we think grades are important, if for no other reason than that they are so widely used. In instances where faculty are asked to identify ideally educated students, or to think of seniors of whom it might be said that they have experienced, in accordance with the ideals of the college, the highest degree of personal development, then those named are not always the A-students.(2) Technically such faculty ratings of students' development may actually be more reliable, that is, more consistent when pooled, than the scores of achievement examinations upon which grades are based.

We would argue, of course, that these general kinds of success ratings and grades based upon achievement examinations are not really comparable, since they concern different aspects of the students' behavior. Most instructors believe that their own responsibility for students' general educational development cannot logically be extended much beyond familiarity with the material of a particular course of study, even though they usually realize, of course, that students should also be developing in much more general ways. In accordance with this limitation, instructors often inform classes that grades will be based only upon specific reading material or upon demonstrated improvement in special skills. Under these conditions many will likely agree that course grades constitute an inadequate, or at least an insufficient, criterion of educational development.

For some time now colleges have been admitting students mainly on the basis of aptitude scores and secondary school grades. Apparently these two kinds of predictors have been regarded as successful, and it has frequently been noted that their multiple correlation with college grade-point-average will stabilize at a moderately high level. It is now known that certain attitude or motivation test scores will also correlate significantly with grades. For example, measures for assessing study habits and attitudes developed by Brown and Holtzman (13) and by Carter (4) will often correlate with grades at least as well as other single measures, and when combined with other predictors they will improve the multiple correlation with grades. Horst (14) reports that 4 out of 14 Strong Vocational Interest Blank scores were useful for predicting grades in various major areas. Fricke (8) has found that certain rather general opinions and attitudes are also related to grades. In fact, even selected personality test items which have been written for use in situations supposedly having nothing to do with college experience are found, after cross-validation, to correlate slightly with grades. Some kinds of motivation and personality measures are, apparently, directly related to college success, even when it is measured by so narrow a criterion as grade-point-average.

Perhaps aptitude, achievement and the more specific kinds of motivation measures will continue, however, to be more directly related to college grades (that is, will correlate more highly with grades) than will the more general measures of student functioning and development. We hope eventually to be able to demonstrate that indirect relationships between college achievement and these more general personality measures, which are now under investigation at the Center, are very important, especially from the educator's point of view. These measures are sensitive to the general level of intellectual and social maturity of students.

In an assessment study directed by Nevitt Sanford, which had as subjects some middle-aged alumnae, it was found that a few who had achieved high grades in college could be described as failures for the period after graduation, and that some others who had obtained only mediocre grades, and who had apparently achieved little else during college, had nevertheless continued to develop intellectually and personally long after college. For the purpose of understanding these kinds of subjects, personality measures prove more informative than college achievement records. Among contemporary student interviewees, it is not hard to find some whose intellectual growth is proceeding partly at the expense of the attainment of high grades.

Although grades constitute an insufficient criterion of success in college, their sheer practicability suggests that they will continue to be used for this purpose. In some colleges today, however, it might be feasible to initiate the use of other criteria of success, in addition to grade-point-average. Some additional variables for consideration for inclusion in multiple criteria experiments are faculty appraisals of general educational progress, measures of intellectual and emotional maturity, the acquisition and degree of clarification of vocational or professional interests, and whether or not students enter graduate school.

Three kinds of variables which are related to success in college, but which are not independent of each other when observed in students, may be distinguished. First, there are the variates directly correlated to a substantial degree with grade-point-average. These include, in addition to the usual ability scores and secondary school grades, some measures of the specific motivation for disciplined study, or of the efficiency with which students can meet course work requirements. Second, there are expressions of intellectual interests and measures of intellectual functioning which are more general than the need merely to obtain high grades. In

the research at the Center we have used a number of these; for example, scales which measure Thinking Introversion, Complexity, Theoretical Orientation, and Estheticism (12,22). A third class of variables is even more pervasive or general, in that they measure broad aspects of personal functioning and development. Here would be included measures of Maturity, of Impulse Expression, of Schizoid Functioning, and the like. For example, a person scoring high on a scale for measuring Social Maturity can be described, in comparison with a low scorer, as realistic and flexible in his relations with others, as tolerant and undogmatic (or as non-authoritarian), and as personally free, without having to resort to rules or rituals for managing social relationships. And in college students this kind of personal freedom or maturity is either prerequisite to, or else concomitant with, the successful cultivation of enduring intellectual values and interests. Ancillary variables which help in the interpretation of these three kinds of measures include the "response sets," which are tendencies to respond to test items positively or negatively, prudently or imprudently, or in socially desirable as distinct from socially undesirable ways. Finally, expressions of interests which are directly related to vocational choice may be conceived as falling somewhere near the second group of variables.

The question of whether attitude, motivation or personality measures might serve as useful predictors of college success, broadly conceived, can be answered affirmatively. Under what conditions, if any, might such measures be used for the actual selection of students for admission to college? This question raises some problems having to do with the social function of colleges. Routine classification of people, on the basis of personal characteristics, has always been considered a risky undertaking, especially if results might affect adversely their future status or welfare. Everyone classifies other persons regularly, of course,

in everyday life and in occupational settings, and therefore the ethical problems of using any kind of test data for classificatory purposes cannot be very different from those which arise in everyday life. The problem may be a serious one for institutions, however, to the extent that the information which is used for purposes of classification may not be communicated sufficiently (or may not yet be sufficiently communicable) to those who are classified. The practice in certain areas of business, or in some kinds of social science experimentation of obtaining personal information by guileful methods is regrettable, and its adverse effects can be overcome only by explanations of the objectives of social science, in language which can be understood by all.

Whether we like it or not, we must continue to decide which among numerous applicants to admit to college. Assume now that a test of motivation has been found, which possesses the necessary kind of validity and which along with other measures contributes substantially to some college-success-prediction formula. This test would very likely contain items by means of which subjects would reveal whether they possessed serious intellectual and esthetic interests. Now, is the aim of the college primarily to encourage research and scholarly investigation, for the purpose of advancing the sciences and the arts, and to do this by educating students, who, preferably, would already possess to a high degree the intellectual and esthetic interests and motives measured by the test? Or, is the college's function primarily to inculcate in students these very interests and motives? In the latter case one would be hard-pressed in the majority of institutions to justify the use of a test which might reject applicants because they were initially lacking in intellectual and esthetic interests. A similar issue has been relatively short-lived in the case of ability testing, mainly because the majority of citizens have been led to believe, correctly or incorrectly, that

aptitude is something which is practically uninfluenced by college education; they are not so likely to be convinced, however, that motivation is equally uninfluenced, nor perhaps should they be.

It seems that one solution to this problem would be for colleges to define more clearly their purposes or functions. Without considering this in its proper detail, is it not conceivable that a college which wished primarily to bring about progress in scientific research or in the creative arts, and which was willing therefore to use motivation or personality measures in its selection battery, could make this fact known in such a way that its needs would be understood and accepted by the public? Very likely this would be most easily accomplished by some of the private institutions. Many public colleges seem to have been exhibiting the same kind of social trend which has been occurring in industry, which consists of a shift from emphasis upon selection of personnel to an emphasis upon optimum classification of anybody who has decided to join the organization. Perhaps for many institutions, new kinds of tests will therefore be most useful for the classification and study of students after they have entered college.

Because of the complexity of the problem in large institutions of admitting those students who will be successful in a great variety of programs, the use of both multiple criteria and multiple predictors, which include scores from new kinds of tests, seems warranted. Consider a problem which must be solved by all students, namely that of choice of an academic major. Only a minority of students enter college with a completely resolved decision concerning their major field of study; but regardless of when such a decision is made, it often seems that the reasons given for it carry little conviction. And in many cases where available background and test data have actually been used to help the student make a decision, he then may find that he has not enrolled at the college which provides

the program he needs.

We have found that personality scores for groups in different majors vary enough so that physics and mathematics majors, for example, are higher than engineering students of the same ability level. Such differences have been obtained on scales which measure degree of interest in ideas and abstractions, theoretical and esthetic orientations, and general level of maturity. To illustrate this, some scores for these three kinds of majors are presented in Table 1. The students in these two samples are male National Merit Scholarship winners and near-winners and freshmen at California Institute of Technology, all of whom were tested before entering college. These particular groups are therefore based on intended major, and the meaning of the scores may be affected somewhat by the presence of students who are uncertain of their major, or else who will not remain in college. If we consider those scales in Table 1 which are marked by asterisks, it becomes obvious that students intending to major in mathematics and physics possess a rather different orientation toward learning than those who choose engineering as their major. The replication, using an independent sample, supports the validity of the observed differences. Scores on the same scales also differentiated even more strongly, in the Merit Scholarship sample, among social science, humanities, and education majors. It is well known, of course, that there are often large variations in measured abilities across groups of majors. In major groups which are homogeneous on ability, or in total student bodies which are relatively homogeneous, the possible misplacement of students might be detected early from their attitude and personality scores. (It is generally recognized (29,6) that the Strong Vocational Interest Blank has been a useful instrument for this purpose. However, the use of personality scale scores can supplement specific interest measures.)

Table 1

Mean Standard Scores on Some Personality Measures Which Differentiate Among High Ability Male Students Who Chose Three Major Programs. (National Merit Scholarship Winners and Freshman Entrants at California Institute of Technology)[1]

Scales***	Engineering		Mathematics		Physics	
	NMS (188)	CIT (30)	NMS (47)	CIT (20)	NMS (94)	CIT (64)
Thinking Introversion*	54.2	54.6	59.2	57.2	60.2	59.9
Complexity	48.2	52.3	54.0	56.8	56.0	57.3
Originality	51.5	51.6	56.0	55.8	57.0	56.8
Authoritarianism	48.0	44.5	42.0	40.5	42.3	39.7
Social Maturity**	50.4	55.0	60.7	61.7	58.7	59.3
Social Introversion	47.8	48.2	51.0	50.7	50.3	53.0
Theoretical Orientation**		54.0		62.2		58.4
Esthetic Orientation*		46.5		50.2		57.1

*Significant at the .01 level - F test (CIT sample)

**Significant at the .05 level - F test (CIT sample)

***All scales resulted in significant F values for the NMS group when one-way analyses of variance tests were made across all major groups, only three of which are included here.

[1]The standard scores are computed with a mean of 50 and a standard deviation of 10 using a random sample of University of California male freshmen as the base distribution.

The growing concern in higher education for better student personnel services, and the increasing use of honors and remedial programs, may be seen, in part, as indicating a need for multiple criteria in defining success in college. Honors programs, or other provisions for superior students, are found in numerous institutions today. In most of them, however, the selection of students for such programs is based only upon ability scores and grades, and provisions for evaluating the programs for their effect on the general development of the students have too often been lacking. From a few evaluative studies (11,7), it appears that some students selected for honors programs never gain much in the seminar situation, and that there is some cause to question not only the effectiveness of the seminars but also the efficiency of the selection process. Table 2 contains data for two hypothetical honors groups which differ considerably. Where seminars are organized within major programs, it would be rare for such a marked contrast between two groups to occur either by selection or by chance. In one institution employing honors seminars, however, each of the four undergraduate classes contains at least fifty students whose individual test scores would not differ significantly from the means of Groups I and II in Table 2. In this school it is likely that some seminars are composed of persons who differ even more than those illustrated by the groups in Table 2. There is no implication here that such diversity is undesirable, but a seminar composed chiefly of the Group I type would be very different from one consisting largely of Group II people; in either case one may wonder how the minority who are different would fare, or, to what extent their progress (even the topical content) is determined by the majority. In the larger institutions it would be feasible to study large variations in the composition of honors groups, even for students who are nearly the same or who are very exceptional in ability. Such research might make it possible to avoid forming

Table 2

Hypothetical Seminar Groups Organized on Basis of Certain Personality Scores

Scales	Group I Standard Scores	Group II Standard Scores
Thinking Introversion	62	47
Complexity	58	44
Social Maturity	65	48
Social Introversion	46	54

groups in which some students would be unable to participate in, or to benefit from, the seminar experience.

Similar programs could also be carried out in order to identify unique individuals for special consideration. If educators sincerely subscribe to the idea that there should be an optimum learning experience for each person, then they cannot be unconcerned about those rare individuals on many campuses who possess not only unusual ability, but also high potential for scholarship and creativity. Such potential may often go unrecognized during crucial stages in a student's development, but personality measures could be used to help identify these unusual persons for special study. Scores on personality inventories could be used as adjuncts to the traditional achievement and ability tests, at least in research aimed at the development of special programs.

This point regarding differential treatment of students can be further illustrated by the data of Tables 3 and 4. We selected two samples of high ability students, one sample high and one low on the following three scales: Thinking Introversion, Complexity, and Originality. To some degree any one of these measures would identify students who had intrinsic interests in knowledge and in intellectual activity for its own sake; to insure the selection of two groups which definitely differed in their intellectual "motivation," we chose students whose scores were at least a half-standard deviation above or below the mean on all three of the scales.

The differences between the two groups of men in Table 3 are perhaps not surprising, despite their magnitudes. For personality measures, when employed as criterion variables to identify extreme groups, will invariably reveal large concomitant differences between the groups on numerous other variables. But most of the specific differences here, due to the particular choice of variables, are

Table 3

Mean Standard Scores on Selected Personality Variables for Groups High and Low on Three Scales (Ti-Co-O) Measuring Intellectual Interests (N's = 40 Males Each)[1]

Instruments and Scales	High Group Mean	Low Group Mean	Difference
OPI			
Authoritarianism	35.2	56.0	-20.8*
Impulse Expression	46.3	38.2	8.1*
Responsibility	62.2	56.3	5.9*
Social Maturity	56.4	41.0	15.4*
Social Introversion	42.3	50.1	-7.9**
Study of Values			
Theoretical	64.1	57.6	6.5*
Economic	38.2	53.5	-15.3*
Aesthetic	59.4	41.3	18.1*
Social	43.6	43.4	0.2
Political	49.5	50.5	-0.9
Religious	46.7	53.0	-6.3*
SVIB			
Artist	46.5	35.1	11.4*
Psychologist	66	47.3	18.7*
Architect	51	42.5	8.5*
Physician	42.3	35.6	6.7*
Mathematician	48.2	46.2	2.0
Physicist	51.7	53.9	-2.2
Engineer	38.2	47.9	-9.5*
Chemist	46.3	48.9	-2.6

*Significant at the .01 level
**Significant at the .05 level

[1]The standard scores are computed with a mean of 50 and a standard deviation of 10 using a large population of college freshmen as the base distribution for the Study of Values and the SVIB; for the OPI scores a random sample of University of California male freshmen serve as the base group.

Table 4

Choice of Major Program for Members of Groups High and Low on Three Scales (TI-Co-O) Measuring Intellectual Interest (N's = 40 males each)

Major Field	High Group N	High Group Percentage	Low Group N	Low Group Percentage
Engineering	5	12.5	25	62.5
Mathematics	7	17.5	0	0.0
Physics	6	15.0	3	7.5
Biology	2	5.0	0	0.0
Psychology	3	7.5	0	0.0
Sociology	1	2.5	0	0.0
Economics	0	0.0	6	15.0
History	6	15.0	0	0.0
English	3	7.5	0	0.0
Music	3	7.5	0	0.0
Industrial Design	1	2.5	0	0.0
Radio-TV	0	0.0	1	2.5
Business	0	0.0	1	2.5
No Choice	3	7.5	4	10.0

highly related to interest in learning and to intellectual activities.

These particular groups, high or low on the composite of three scales, are drawn from the large sample of National Merit Scholarship winners. On a measure of socio-economic background the means and standard deviations were identical for the two groups. The same is true for the Mathematical scores on the Scholastic Aptitude Test, but the Verbal aptitude mean for the high group was approximately one-half-standard deviation greater than for the low groups. However, the Verbal score for the lower group was still more than one-helf-standard deviation above the national average. The obtained differences in Table 3 are perhaps partly due to verbal intelligence or facility, but they are greater than would be expected from this alone.

This classification based on the three measures did not result in differences on scales of the Minnesota Multiphasic Personality Inventory, except for small ones on the Social Introversion and the Hypomania scales (9). The MMPI scores indicated, briefly, that one group was about as "normal" as the other.

The results in Table 3 are provocative, even though technically they can hardly be described as validity data -- nor are they viewed as such by the writers. The differences indicate greater maturity and much less authoritarianism for the high group , the groups varying by more than one-and-a-half standard deviations. These differences, together with those for the Impulse Expression scale and the Study of Values Religious scale (1), indicate that for the high group there is more freedom and less rigidity in thinking, and more willingness to relinquish traditional or fixed values in order better to examine the new and the different.

The obtained differences on the Economic scale from the Study of Values, the Engineer scale and the first four scales on the Strong Blank imply that the low group has a much more applied and pragmatic orientation than the high group.

Previous research at the Center (18,23) has shown that the Theoretical and Aesthetic scales in the Study of Values, and the Artist and Psychologist scales from the Strong Blank, are high correlates of intellectual interest. From the scores in Table 3 it seems safe to conclude that a very different orientation and pattern of motivation distinguishes these two high ability samples.

The choices of majors for the two groups of Table 3 appear in Table 4. We normally expect persons with different sets of attitudes and different motivational patterns to choose different fields for study, and Table 4 supports this notion well. Referring back to the mean scores for certain major groups in Table 1, we surmise that some of the students will not long remain in their chosen majors.

Using a large sample of freshmen of average college ability from a public institution, it has been found that those high on Social Maturity are also very likely to be those who express serious interests in ideas, in the appreciation of literature and the arts, and in the intellectual life generally. It perhaps should also be noted that seniors will score higher than freshmen, not only on Social Maturity, but also on the scales which more directly measure intellectual and esthetic values. In other words, the phenomena of general maturity and intellectual values are significantly correlated in college students. A few personality scales yield scores which vary over some simple age-related criteria, such as college classes, even more than they vary over the groups of college majors. This was found to be the case in both the Vassar studies (20,21) and in a thesis project using data from a number of institutions, which was carried out by Brown (3) at Minnesota. This has led to some theorizing about the developmental changes which are observed to take place in college students.

The majority of student bodies in institutions of higher education can be described as very diverse or heterogeneous. Previous reports from the Center

(10,17) have emphasized that most four-year institutions, when considered singly, have students whose academic aptitude scores range across at least four standard deviations of the total distribution of entering freshmen in the nation. This range of ability, which in some cases results in classes containing students whose IQ's will differ more than thirty points, provides part of the logic behind the initiation of honors programs. As suggested previously, however, we have scarcely begun to examine the diversity of students if we confine our attention to ability scores. The picture naturally becomes much more complex when motives, personality traits and background factors are also examined. For example, within National Merit Scholarship samples, in which ability is relatively homogeneous, there are large variations in expressed theoretical, esthetic and religious values, as well as on scales measuring other characteristics and attitudes.

Some personality scores also vary considerably from one institution to another. To cite one example -- for students at the same class level and for students in different classes -- in a comparison of scores on the Impulse Expression scale for students at two women's colleges, freshmen at one college scored higher than seniors at the other, even though within either institution the seniors obtained higher scores than the freshmen. Interesting differences can be obtained which might characterize total student cultures. In research with National Merit Scholarship winners, a group supposedly representing the top 2 per cent in ability, significant differences were found on numerous traits between students choosing Catholic and those choosing Protestant colleges, for example, and between students in colleges noted for their scholarship and those in attendance in institutions where scholarship attainments were not impressive. We have some idea of the differences to be expected for sectarian or fundamentalist campuses, in contrast with campuses where there are large proportions of liberal

agnostics, and between institutions which admit students who are primarily from low socio-economic backgrounds in comparison with those where the socio-economic level is higher.

Turning again to some illustrative data, in Table 5 we have selected two four-year, liberal arts colleges which happen to have almost equivalent academic aptitude scores, both drawing student bodies whose mean SAT scores are considerably above the national mean. If the respective faculties knew only the mean ability scores, what would they expect regarding the general motivation, the interests, and the personalities of these supposedly similar groups? Could they anticipate the same orientations toward the pursuit of knowledge, the same breadth of interests, the same zealousness (or lack of it) in the classroom?

A score of 50 in Table 5 represents the mean for an average college population; a large sample with a mean ability score at the national freshman average was used as a reference group. Despite the elevation for both groups, the mean scores in Table 5 are about two-thirds of a standard deviation apart for the various scales. There are some substantial scale intercorrelations (to be discussed in a later paper), but the consistency of differences nevertheless suggests some specific interpretations. Here we confine our interpretation to a general one, namely, that College No. 1 students could be described both as more intellectually oriented and as more free to pursue intellectual interests. In the realm of ideas they may well be the risk-takers and experimenters.

The overlap of individual scores between distributions, such as those in Table 5, is of legitimate concern. Needless to say, students of both "types," as revealed by these means, will be found on both campuses, and this brings us back to the topic of diversity within single institutions. The scores on a few variables in Table 6 illustrate such diversity; they are for three sub-groups of the

Table 5

Mean Standard Scores on Selected Personality Scales for Male Freshman Students in Two Liberal Arts Colleges[1]

Scales	Means	
	College No. 1	College No. 2
Thinking Introversion*	63.1	58.1
Complexity*	66.1	60.1
Originality*	64.5	58.1
Social Maturity	68.8	61.8
Social Introversion**	52.0	48.2
Theoretical Orientation*	69.1	62.8
Esthetic Orientation*	63.2	56.8
Impulse Expression*	56.2	50.0
Developmental Status*	62.6	54.6

*Significant at the .01 level
**Significant at the .05 level

[1]The standard scores have been computed using a sample of freshman men whose mean ability score is at the national mean for entering students.

Table 6

Mean Standard Scores on Selected Personality Scales for Sub-groups of Sophomores in One Liberal Arts College[1]

Scales	College No. 2 Freshman Means	Sophomore Means Group a	Group b	Group c
Thinking Introversion*	58.1	57.8	59.3	67.3
Complexity*	60.1	57.0	62.6	68.3
Social Introversion**	48.2	46.8	52.1	45.4
Developmental Status*	54.6	57.6	61.6	70.8

* Significant at .01 level (Sophomores - F test)
** Significant at .05 level (Sophomores - F test)

[1] The standard scores have been computed using a sample of freshman men whose mean ability score is at the national mean for entering students.

sophomore class in College No. 2. If we make some allowance for the age difference (especially as it affects the Developmental Status scale), we can use the scores for the freshmen as a point of reference. The freshmen means for the scales from Table 5 also appear in Table 6.

The three groups designated a, b and c may be briefly described as follows: a are the socially oriented, who have a high amount of school spirit, and who tend to emphasize vocational goals; b are the independents, who are unaffiliated with particular social groups; they seem to be "non-collegiate," but are interested both in their professional subject areas and in the social and political issues of the day; and c are the intellectual liberals, who tend as a group to be critical nonconformists; many of them are chiefly interested in the humanities and in the creative arts. The three groups, which may be viewed as sub-cultures on the one campus, are based on the judgments of observers, and are therefore independent of the test data collected from these students. Of the three groups, the smallest contains about 40 students. Although the b group appeared slightly more heterogeneous on all measures, the variances across scales for the three groups do not differ significantly.

As it appears from these means, sub-cultures of students within some institutions may be quite diverse. A substantial portion of the students in College No. 2, to judge from these sophomore data, scoresas high as or higher than the students of College No. 1, but most of them are in one sub-culture. We may inquire again about the importance of specific educational accommodations for students who are diverse in their attitudes and orientations. It is also important to consider the contributions the persons in diverse groups may make to the life and climate of the college. For example, to what extent is any of the three groups essential to the prevailing intellectual climate and to the welfare of

the other students? Would any group be better off in an environment consisting predominantly of peers who have attitudes and interests more like their onw?

How can data revealing these varying student characteristics best be used? Should students be encouraged by counselors to decide against enrollment at a college where they would find themselves, with their particular attitudes and values, in a very small minority? Fricke (7) found few admissions officers who would advise students not to apply for admission because of measured ability which was high for the institution. Should highly capable students with scholarly interests be discouraged from attending colleges with average or below average student bodies? A number of other significant questions might also be raised. For example, should high school graduates of unusually high social maturity be discouraged from enrolling in overprotective collegiate institutions?

We tend now to suppose that smaller colleges may soon be forced to become more selective on several kinds of variables; that is, that they may have to "specialize." Larger institutions may need to become more differentiated from within. These developments become feasible as more reliable information about institutions becomes available generally. We believe there can then be a realistic consideration by prospective students of the kinds of institutions which are available to fit their needs. Such a trend might be abetted in specific cases, by the colleges concerned, if they were able to exercise some initiative in changing admission and classification policies.

Having discussed variations of student characteristics, both between and within institutions, we should not neglect the fact that the selection of students for admission is affected, and sometimes markedly, by students' own choices of colleges. Much of the change in values, which Jacob (16) and others believe takes place in students who attend the more unusual private liberal arts colleges, may

be due to the large proportion of capable students who at the time of admission already possessed a readiness to learn and a definite need or willingness to change. For reasons discussed by Clark (9) these students tend to be present in greater numbers among the applicants to colleges which are known primarily to emphasize intellectual and liberal values. The selection problems are therefore different for different colleges, not only because available applicants may differ widely in ability from college to college, but also because they may differ greatly in many other characteristics. It should not be implied that selection problems will necessarily be simplified merely from knowledge of the variations in consciously expressed motives of applicants; for example, Iffert (15), using data from a nation-wide survey, found no relation at all between students' expressed "reasons for going to college" and their persistence in remaining in college. We think, however, that the more general kind of personality traits which have been discussed, without which expressed motives tend to be superficial and inconsequential, will necessarily be important for students' educational progress. We have observed significant variations in such traits for freshmen of various colleges who may be quite similar on other less general traits, including various measures of aptitude.

It was suggested several years ago to one of the authors, by an admissions committee, that they would like to learn how to reduce admissions of those students who, although intelligent enough, were nevertheless passive in their approach to learning, and basically disinterested in intellectual problems and pursuits. These students constituted a sizeable proportion of the entire student body, and they exerted a demoralizing effect on the faculty because they were intelligent enough to provide impressive non-intellectual models for other students, some of whom had expressed serious intellectual aspirations at the time of entering college.

Presumably a sufficiently large number of freshmen, deliberately selected to be high on scales measuring Social Maturity, Thinking Introversion, Complexity, Impulse Expression, Theoretical Orientation, and the like, would have had, from the viewpoint of the teaching faculty, a remedial effect upon the entire institution.

We do not know the optimum degree of diversity which should exist on any campus, nor within single classes or seminars. Neither could we argue unequivocally for selection within limited ranges of variation on the measures we have discussed. But where there is already a trend toward greater selection or concentration of highly capable students, we would encourage greater consideration of additional personality or motivation variables. As more becomes known about student characteristics, and as progress is made in understanding the processes of personal development in young adults, educators should be able to accommodate more adequately the rapidly increasing student populations.

References

1. Allport, G. W., Vernon, P. W. and Lindzey, G. Study of Values (Rev. ed.). Cambridge, Massachusetts: Houghton Mifflin Co., 1951.

2. Brown, D. Non-intellective factors and faculty nominations of ideal students. Mellon Found. Res. Rep., Vassar College, Sept., 1959 (mimeographed).

3. Brown, F. G. Measured personality characteristics of liberal arts college freshmen. Unpublished doctoral dissertation, Univer. of Minnesota, 1958.

4. Carter, H. D. Some validity coefficients for study test scores. Calif. J. educ. Res., 1956, 7, 212-216.

5. Clark, B. R. The influence of organization image on student selection. Paper read at Conf. on Selection and Educational Differentiation, Univer. of California, Berkeley, May, 1959.

6. Darley, J. G. and Hagenah, Theda. Vocational interest measurement. Minneapolis: Univer. of Minnesota, 1955.

7. Fricke, B. G. How colleges should ckeck their students. Coll. Bd Rev., 1958, 34, 17-22.

8. Fricke, B. G. A report on the freshman honor students at the University of Michigan, fall 1957. Univer. of Michigan: Bureau of Psychological Services, Evaluations and Examinations Division, 1958 (mimeographed).

9. Hathaway, S. R. and McKinley, J. C. Minnesota Multiphasic Personality Inventory (Rev. ed.) New York: Psychological Corp., 1951.

10. Heist, P. The diversified student population of American higher education. Paper read at the American Psychological Association Symposium on Social Psychology of American Higher Education, Sept., 1958.

11. Heist, P. Evaluative report on the superior student seminars in psychology. Rep. to Administration and Curriculum Committee, Oregon State College, 1954 (mimeographed).

12. Heist, P. and Williams, Phoebe A. Manual for the Omnibus Personality Inventory. Univer. of California, Berkeley: Center for the Study of Higher Educ., Nov., 1957 (mimeographed).

13. Holtzman, W. H., Brown, W. F., and Farquhar, W. G. A Survey of Study Habits and Attitudes: a new instrument for the prediction of academic success. Educ. psychol. Measmt, 1954, 14, 726-732.

14. Horst, P. Differential prediction of academic success. Paper read at Conf. on Selection and Educational Differentiation, Univer. of California, Berkeley, May, 1959.

15. Iffert, R. E. Retention and withdrawal of college students. Washington: U. S. Government Printing Office, 1958.

16. Jacob, P. E. Does higher education influence student values. National Educ. Ass. J., 1958, 47, 35-58.

17. McConnell, T. R. and Heist, P. Comparing students in institutions. Paper read at Amer. Personnel and Guidance Ass., Symposium on Admission Policies to Serve the Needs of the Community, March, 1959.

18. McConnell, T. R. and Heist, P. Do students make the college?. Coll. Univer., 1959, 34, 442-452.

19. Strong, E. K., Jr. Vocational interests 18 years after college. Minneapolis: Univer. of Minnesota, 1955.

20. Webster, H. Changes in attitudes during college. J. educ. Psychol., 1958, 49, 109-117.

21. Webster, H. Some quantitative results. J. soc. Issues, 1955, 12, 29-43.

22. Webster, H., and Heist, P. Construction of a multiple trait personality test for use with college populations. Res. rep. for the Soc. Sci. Res. Council Conf. on Personality Measures Relevant to College Purposes. Univer. of California, Berkeley: Center for the Study of Higher Educ., Jan., 1959 (mimeographed).

23. Weissman, M. P. An approach to the assessment of intellectual disposition among high-ability students. Unpublished doctoral dissertation, Univer. of California, 1958.